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SCIENCE NEWS LETTER



THE WEEKLY SUMMARY OF CURRENT SCIENCE •



JULY 16, 1932

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Edited by WATSON DAVIS

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DO YOU KNOW THAT?

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A baby gorilla "purrs" when fed.

China has a national weather bureau just four years old.

Paint exposed to the weather ordinarily lasts about five years.

Of the 202 species of cacti in the United States, 96 species grow in Texas.

The metal indium, discovered in 1863, got its name because of the indigo-blue lines in its spectrum.

It isn't the thunder that turns milk sour in a thunderstorm, it's the heat which causes bacteria to become over active.

The Trojans named the mouse as a symbol of Apollo, because of a legend that Apollo sent mice to gnaw the leather from the enemy's shields.

Museum workers have solved the problem of making the ears of mounted animals retain their shape by inserting lead into the ear-case of skin.

Welding by gas torch and electric arc made it possible to enlarge a ten-story medical office building in Cleveland,

without disturbing the physicians and dentists.

Cattle growers in Montana are trying the system of quick-freezing beef before shipment, rather than transporting carloads of live animals to market.

With a powerful photoelectric photometer attached to a telescope, the brightness of a star can be measured to within one-half of one per cent of its value.

The University of New Hampshire reports that housewives seeking low cost meals are returning to such pioneer dishes as chowder, hominy, and apple pie dowdy.

Farmers cannot hope to kill weeds by plowing them under, is the verdict by government scientists who dug up weed seed buried 30 years, and found the seeds still amazingly vital when planted.

Bootlegging milk is a racket now troubling health officials in New York where milk from un-inspected sources is being delivered by gangsters who threaten inspectors and send armed convoys with milk trucks.

WITH THE SCIENCES THIS WEEK

Curiosity arousing questions for the teacher and general reader. Book references in italic type are not sources of information of the articles, but are references for further reading. Books cited can be supplied by Librarian, Science Service, at publisher's price, prepaid in U. S.

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ASTRONOMY

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GENERAL SCIENCE

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GEOGRAPHY

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MEDICINE

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Do the most severe tumors contain a high percentage of fatty substances? p. 41.

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PHYSICS

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How much skin need one expose to the sun for adequate protection from rickets? p. 39.

PSYCHIATRY

Can hypnotism benefit medicine? p. 39. Methods and Uses of Hypnosis and Self-hypnosis—Bernard Hollander—Macmillan, 1928, \$2.50.

PUBLIC HEALTH

Can malaria be transmitted without the mosquito? p. 40.

Is the pace of life now faster than at the time of William the Conqueror? p. 33.

What diseases mar the good health record for 1932? p. 37.

CHEMISTRY

Double Weight Hydrogen Found in Water Electrolysis

Commercial Hydrogen-Oxygen Plants Yield Water Containing Abundance of Hydrogen Isotope Two

A PLENTIFUL supply of newly discovered double-weight hydrogen atoms exists in the apparatus used commercially to break down water into oxygen and hydrogen gases by passing electricity through it.

This has been determined through joint research by Dr. E. W. Washburn of the National Bureau of Standards in Washington and Dr. Harold G. Urey of the chemistry department of Columbia University, New York.

The existence of a hydrogen isotope of atomic weight two, twice the ordinary hydrogen atom of mass one, was discovered last year by joint research between the same two institutions. This was hailed as an important development bearing upon the constitution of matter and the way in which elements are distributed in nature.

The scientists set about to find ways of separating the heavier atoms of hydrogen, which are relatively rare, from the light atoms of hydrogen, which are plentiful. It was recognized that when hydrogen gas is formed by electrolysis of water, the two kinds of hydrogen atoms or ions do not have an equal chance to get into the hydrogen gas that is formed. The heavy, or double-weight, hydrogen atoms would be likely to be held back in the water, while the lighter isotope one hydrogen would be most likely to pass off.

To test this theory of the concentration of isotope two hydrogen, a water electrolysis experiment was begun at the Bureau of Standards. This test is not yet complete.

But it was possible to take advantage of water electrolysis processes operated commercially over a period of a year by plants producing oxygen and hydrogen gas for industrial use. As every school boy knows, water consists of two parts hydrogen and one part oxygen, and electricity breaks it up into the two gases. Residual water from two such plants was broken down into hydrogen and oxygen gases at Columbia University and examined with the spectroscope. As was expected, larger amounts of the isotope

two hydrogen were found than of the isotope one variety.

Plans are underway for the concentration of large quantities of the double-weight hydrogen from the old water of electrolysis plants in order that this unusual kind of hydrogen may be thoroughly investigated.

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BOTANY

Russian "Velvet Tree" May Compete With Cork Oak

COMPETITION with the cork oak, classic cork-producing tree of southwestern Europe, may be offered by the "velvet tree," native to wastelands in Japan, China and Russian Asia. Prof. E. E. Kern of the Institute of Plant Industry has been investigating its possibilities, and finds that though the cork it produces will not do for bottle stoppers, it is quite satisfactory for insulation and other purposes.

The tree belongs to the same botanical family as the citrus fruits. It is known as *Phelodendron*, which is Greek for "cork tree." It reaches a height of about fifty feet, and attains an extreme age of 300 years. Cultivation, Prof. Kern states, improves the quality of its corky bark.

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CHRONOLOGY

Millions of American Clocks Have Only Five-Second Error

ARE Americans living on time? Many of them regulate their activities within a maximum error of five seconds, is the answer of Henry E. Warren, president of the Warren Telechron Co., in a paper presented before the International Electrical Congress in Paris. Mr. Warren described the development and increasing use of electric clocks that maintain their accuracy from the frequency of the power supply.

He said that in order to determine the accuracy of time pieces of this kind a study was made of one of the largest

power systems in the country for 16 weeks. During this period there was never a deviation of more than five seconds faster or slower than the correct time. Mr. Warren believes that the time service on many other large systems is as good as this.

In order to keep the tiny home clock accurate, it is necessary that huge turbines and generators run exactly at the right speed, the paper brought out. Operators observe a master clock and occasionally manually change governor settings to maintain the split-hair regulation.

Mr. Warren estimates that there are more than 4,000,000 of these little clocks in the United States. Although each is very small and consumes little energy, he thinks that the 4,000,000 clocks must bring power companies more than as many dollars in revenue each year. The power output of each ranges from less than one-millionth to more than one ten-thousandth of a horsepower. The power output of a spring clock, however, was said to be even smaller, easily amounting to less than one twenty-millionth of a horsepower.

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ICHTHYOLOGY

Michigan Fish Often Have More Than One Head

"SIAMSE TWINS" among fish are a common occurrence in Michigan. The State Fish Division reports that probably no other group of living



NOT UNUSUAL

Some become adults and occasionally a fisherman catches one.

creatures produces more abnormalities.

In the state hatcheries two-headed fish are not unusual, and instances have been noted of five perfect heads to a single body and tail. While these fish do not generally live past the stage when artificial feeding becomes necessary, they occasionally do live to the adult stage.

A few years ago a legal-sized perch having two heads was caught in a lake near Cadillac.

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PHYSIOLOGY

Diabetic Burns Fat Instead Of Sugar During Exercise

EXPERIMENTS showing that sufferers from diabetes probably burn fat instead of sugar when they exercise or do muscular work were reported by Dr. William H. Chambers of Cornell University Medical College to the American Association for the Advancement of Science meeting in Syracuse.

When the pancreas fails to produce enough insulin, diabetes follows. Scientists differ as to whether the diabetic condition is caused by an overproduction of sugar from fat or is due to a loss of the ability to burn sugar, Dr. Chambers pointed out. Recent studies of diabetics during exercise have seemed to show that they burn some sugar during exercise and that therefore the over-production idea was correct. Dr. Chambers' studies, on the contrary, indicate that this theory is probably not correct and that even during exercise the diabetic is burning fat and not sugar.

The method of determining whether the body is burning fat or sugar consists of measuring the ratio of the carbon dioxide output to the oxygen intake. When fat is burned the quotient of carbon dioxide divided by oxygen is 0.71, and any rise in this figure shows that sugar is being burned, he explained.

His investigations showed that there was a rise in this figure during exercise in diabetic animals, but he also made measurements during the rest or recovery period following the exercise and studied the blood composition during this time. From these findings he concluded that the rise in the figure for the diabetic during exercise is due to change in the acid-base balance of the body and not to the burning of sugar, and that consequently the diabetic burns fat for fuel during exercise as well as when at rest.

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PHYSICS

Cosmic Ray Intensity Varies With Change in Latitude

Dr. Compton's Findings From World-Wide Observations Question Theory Proposed by Dr. Millikan

COSMIC RAYS do not bombard the earth with equal intensity from all directions, but their strength increases with the distance north and south of the earth's equator, Dr. A. H. Compton, Nobel prize physicist of the University of Chicago, reports in the *Physical Review*.

This is the first report from an extensive world-wide survey during which many physicists are making observations in remote localities. Dr. Compton transmitted this initial report from the Tasman Sea, during travel to new observing stations after research at Hawaii, New Zealand and Australia.

Birth Cries?

The definite differences in the intensity of the cosmic rays at different latitudes shown by Dr. Compton's report are likely to upset present ideas of the origin and nature of the cosmic radiation. Dr. Robert A. Millikan, of the California Institute of Technology, like Dr. Compton a Nobel prizeman, has consistently found that the intensity of the cosmic radiation is independent of the latitude at which the observations are made. Dr. Compton's report does not confirm Dr. Millikan's findings.

Dr. Millikan has suggested that the cosmic rays may be the birth cries of the synthesis of heavy elements out of hydrogen and helium in the depths of the universe. This theory is based upon his findings from wide-flung researches that cosmic radiation bombards the earth equally from all directions. With Dr. Compton's report this theory is likely to lose support.

Strongest at Equator

Dr. Compton reports that so far as the measurements have gone they indicate "uniform variation with latitude, showing a minimum at or near the equator and increasing intensity toward the north and south poles."

At sea level, the difference between intensity at latitude 45 degrees and zero degrees is roughly 16 per cent, whereas at an elevation of 9,000 feet the differ-

ence is about 23 per cent. This would indicate, Dr. Compton says, that it is the least penetrating part of the cosmic rays which varies most rapidly with latitude. No significant variations with longitude have been noted.

Observations recorded in Dr. Compton's report include those made from Mt. Evans in this country, from the Jungfraujoch in Switzerland, as well as the measurements made by Dr. Compton and associates during this present extensive trip.

Prof. R. D. Bennett of the Massachusetts Institute of Technology has planned with Dr. Compton the world-wide survey which is being supported by the Carnegie Institution of Washington.

The cosmic ray research has claimed one life. Allen Carpe lost his life while climbing Mt. McKinley in Alaska in May on his way to Muldrow Glacier to make cosmic ray measurements. Prof. Bennett will take up the work that was thus interrupted.

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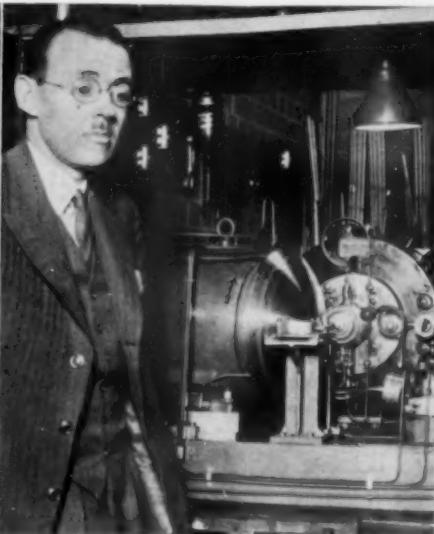
ENTOMOLOGY

Male Butterfly Carries Perfume for His Mate

DIFFERENT butterfly species seem to have their own individual taste in perfume. The perfume exuded by the scent scales of common American species of butterflies covers a wide variety of delightful odors resembling some of the more fragrant flowers, a report of Austin H. Clark issued by the Smithsonian Institution reveals.

Sandalwood, red clover, milkweed, crushed violet stems, dried sweet grass, violets, musk, mignonette, and sweet briar are among the flower fragrances imitated by the butterflies. Unlike fashions in the human world, it is the male who wears the perfume. Females of the same species whose males exude the delicate pleasant odors give off a powerful nauseating smell.

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PICTURING EXPLOSIONS FOR STUDY

The flame, shown on the left, followed the detonation of a mixture of oxygen and carbon monoxide in a tube one inch in diameter. It traveled six feet during one fifteen-hundredth of a second and in so doing spiraled at the rate of 26,000 rotations a second. R. P. Fraser, the photographer-scientist, is standing by his apparatus on the right.

PUBLIC HEALTH

People With "Nerves" Found To be Most Accident Prone

ONE out of every four people in factories and offices are afflicted with "nerves," a word often used to describe a condition that is little understood. Investigations made by Great Britain's Industrial Health Research Board also show that the word "nerves" must be used to explain many human factors which hinder industrial efficiency.

The British investigators ran up against the problem of nervousness symptoms when they looked into the matter of both trivial and serious accidents in industry. Those who are emotionally unstable have more accidents and there is hope that they may be picked out by simple tests, such as the psycho-galvanic reflex or a dotting machine test. Since accident-prone people are dangerous both to themselves and to those around them, it is important to recognize "nervous" people before they have accidents.

Most Important in Employers

The investigations in England have progressed so far that Dr. Major Greenwood, who tells of them in *Human Biology*, holds out hope that combined

use of psychological tests and examinations by specially trained physicians will prove practical. Workers in offices where nervous tension is high will be interested in finding that the "nerves" of employers are more important to efficient work than the "nerves" of the employees.

As to the cause of our nervous world today, Dr. Greenwood will not agree with those who argue that we are living at too fast a pace.

Life Longer and Slower

"In this age of the world," says Dr. Greenwood, "'nerves' are more important than in the age of William the Conqueror not because the pace of life is faster than in 1066 but for the precisely opposite reason. It is so much slower. Life in old England may have been merrier but it was certainly shorter than it is now, the struggle for bare existence keener. Hardly any people in this country, speaking statistically, are in imminent peril of actual starvation. Millions of people now have leisure for reflexion. They may not be acutely hungry, they are not in imminent peril of death, but they are insecure."

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ENGINEERING

Explosions Photographed By Revolving Mirror

EXPLOSIONS are photographed in one twenty-five thousandth of a second in apparatus perfected by R. P. Fraser at the Imperial College of Science, London.

To find out what takes place during an explosion, a double-sided mirror is rotated at speeds up to 30,000 revolutions per minute in an airless chamber. The flame is photographed upon a film that is moved at the rate of over a half-mile a second. A mixture of one part oxygen and two parts carbon monoxide gas was found to produce a flame that spins in a spiral during its explosion.

The research is being conducted in the laboratory of Prof. W. A. Bone to discover ways of improving the efficiency of internal combustion engines such as those used in automobiles and airplanes.

Other photographs show the effect of shock or compression waves that frequently accompany explosions. They were taken after the actual detonation had been induced by shock waves, which appear in the photograph as parallel dark lines.

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GEOGRAPHY

Russian Scientist Predicts Finding of New Arctic Isle

THERE is an island in the Kara Sea, north of the line where Europe and Asia join. Prof. V. Vyse, Russian geographer, has made this declaration as the result of his studies of data on water temperatures, ice drift, bottom contours and other phenomena, brought back by the Soviet ice-breaker "Sedov."

This is not Prof. Vyse's first prediction of this kind. Before the "Sedov" exploratory cruise in 1930, he based a similar declaration on similar data for another location; and the island was found there as he said it would be. It was named Vyse island, in his honor.

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Growing girls shoot up fastest at about 13 years of age, while boys have their fastest wave of growth when about fourteen and a half.

The average person in this country spends \$5.50 a year for drugs and medicines, it is reported by the Committee on the Costs of Medical Care.

MEDICINE

Art Reveals Mankind's Ailments

By Making Diagnoses of Paintings and Statuary, a Physician Unravels the Story of Man's Ills Through the Centuries

By JANE STAFFORD

A BALTIMORE physician recently held a strange sort of clinic. The patients were all figures painted on canvas or sculptured in bronze many centuries ago. They could not tell him how they felt or where they had a pain or any other symptoms. Yet he was able to diagnose their ailments.

You may have looked at the same pictures and statues many times and never noticed that they were commentaries on the diseases and deformities humanity suffered from during the artist's time. It takes a physician to walk through an art gallery and to see the range of ailments that have afflicted mankind at all stages of history.

It was a study of history that started the Baltimore physician, Dr. John Ruhräh, on the investigations which led finally to his holding this strange sort of clinic at a recent meeting of his fellow physicians. Dr. Ruhräh devotes himself especially to treating diseases of children, and he wanted to know all about how such conditions had been treated from earliest times. In fact, he was interested not only in the methods of early pediatricians but in their biographies as well. So, by way of recreation from his practice he delved into old books and records, and, since pictures are good records, he studied them, too.

Prince With Paralysis

In Copenhagen, at the Carlsberg Glyptothek, which is a museum of antiquities, Dr. Ruhräh found a 30-century-old Egyptian stone on which are carved the figures of a young prince and his family. It is thought that the prince suffered from infantile paralysis in his youth, for his right leg shows the deformity typical of this disease. The shortened, wasted limb is, unfortunately, such a familiar sight because of the frequent outbreaks of the disease in our own times, that you would have no difficulty in recognizing it from the picture. The young man of the stone picture was Ruma, prince of the eighteenth dynasty of Egyptian rulers whose reigns stretched from 1580 to

1350 B. C. Ruma had charge of the temple of the goddess Astarte, in Memphis, from which the carved stone doubtless came. With him are shown his wife, Imoa, and their child. Apparently they are bearing offerings to the goddess whose temple was Ruma's special care.

Prince Ruma was the first patient Dr. Ruhräh showed at his unique clinic. This Egyptian ruler is thought to have had the earliest case of infantile paralysis, or poliomyelitis as physicians call it, on record. But Dr. Ruhräh questioned whether infantile paralysis really was the disease from which he suffered. He pointed out that the paralysis and deformity of his leg might have been due to some other disease affecting the nervous system, or to a hip joint disease contracted when Ruma was a baby.

Whatever caused the deformity, the stone carving is an indication of the realism of these ancient Egyptian artists, who did not hesitate to portray even princes with well-marked signs of human frailty and disease.

Biblical Epileptic

The second patient whom Dr. Ruhräh called at his clinic was a lad he found in a corner of Raphael's famous painting of the Transfiguration. You are doubtless familiar with the picture, but did your eyes ever stray from the central figure to the group in the lower right-hand corner? In the midst of this excited group a man and woman are supporting a lad who is apparently seized in some sort of convulsion. Dr. Ruhräh called attention particularly to his eyes and hands. The eyes are wildly rolled upward and outward so that chiefly the whites show. The boy's mouth hangs open. His hands are flung out in a meaningless gesture but with the fingers held in cramp-like positions. To the physician, these hands and eyes show that the lad suffered from some disease of the nervous system. According to the symptoms given by the child's father in the Biblical account of the scene, the lad was suffering from epilepsy. He frothed at the mouth, he was "lunatic" and he had fits during which he fell into the

fire or into the water. Epilepsy even to day is not very well understood, but physicians are agreed that it is a disease of the nervous system. The lad in Raphael's painting judging from his appearance might have had epilepsy, or he might have had some other ailment affecting his brain and nervous system.

Paralytic From Birth

In another of Raphael's paintings, the one showing St. Peter and St. John on the steps of the Temple, is a cripple with twisted legs and feet. Considering him from the purely medical viewpoint, he suffered from spastic paralysis. According to the Bible story he suffered from some congenital disease; that is, he was born with the condition which prevented his legs from developing normally so that he could walk. He is shown in the painting at the moment when Saint Peter took him by the hand and healed him. Raphael used his imagination in this picture, Dr. Ruhräh thinks, because if the man had suffered from spastic paralysis from birth he would not have been able to exercise his legs enough to get so much muscular development as he has in this painting.

For the next demonstration at his unique clinic, Dr. Ruhräh showed an entire group of patients on a canvas. In a Berlin gallery hangs a painting by the Italian artist, Sandro Botticelli, of the Madonna and Child with the two Saint Johns. Both Mother and Child, Dr. Ruhräh pointed out, suffered from arthritis or rheumatism as it is sometimes called popularly.

If you look closely at this painting you will see that the Mother, the Child and even possibly the Saint at the right have the nobby finger joints you have seen on the hands of your friends or relatives who suffer from arthritis. This characteristic sign is especially noticeable in the Child's right forefinger. In addition, Dr. Ruhräh called attention to the shape of the Child's head and His bowed legs, which indicate that He also suffered from rickets.

Signs of disease and deformity appeared in the paintings and sculpture of ancient times for various reasons. Sometimes it may have been merely because the artist's models suffered from these conditions. Or they may have been very prevalent during the artist's time, so



A GOITER BROUGHT BEAUTY

—*to Monna Pomona, the lovely Italian lady painted by Rosetti. Rosetti painted other goitrous girls, for they were considered beautiful.*

that he either did not notice them as being unusual, or else he painted them intentionally because that was the way most people looked to him.

However, certain conditions which we now see merely as symptoms of disease were in former times considered marks of great beauty. Such, for instance, is the enlarged thyroid gland, or goiter. Do you remember the lovely maidens painted by Rosetti and did you ever notice that their swan-like necks were goitrous? The beautiful *Monna Pomona* is a particularly good example of this type of so-called beauty and also of the simple goiter seen commonly in Switzerland and in some parts of the United States where the drinking water and food are lacking in iodine.

Dwarf God

For his next patient, Dr. Ruhräh called on a statuette of one Khnouhmou, the ancient Egyptian god of perfumes. This tiny creature was an achondroplastic dwarf, Dr. Ruhräh said.

Dwarfs have been popular with artists and with royalty for many centuries, he explained. The Egyptians made court playthings and favorites of captives from dwarf or pygmy tribes of the interior of Africa. They even represented some of their gods as dwarfs.

This tiny fellow shows signs of a condition known to physicians by the long name of achondroplasia. He has a nor-

mal sized head and trunk, but his arms and legs are very short. The fingers of this sculptured figure are not quite so characteristic. You can see they are of almost equal length, but they should diverge from the middle joints to give the hand a trident shape.

Dwarfs of this type usually reach a height of about 3 or 4 feet. They are well-nourished and strong and of average intelligence. Their condition is due to the fact that the long bones of their bodies united with the cartilage of the joints too soon and consequently the long bones could not grow normally. This is what gives these dwarfs their short, stumpy arms and legs.

Another type of dwarf often seen in paintings is the cretin. These creatures, familiar to you in the paintings of the Spanish court by Velasquez, failed to grow normally because from birth their thyroid glands did not secrete enough of the hormone, thyroxin.

From a painting by Petrus Brandel, Dr. Ruhräh called his next patient, the blind Tobias of the Bible. You remember that Tobias' son was led by an angel to a lake where he caught a fine fish. Then, still under the angel's guidance and according to her directions, he removed the gallbladder of the fish and laid it on his father's eyes. This restored Tobias' sight. In Brandel's picture you see the angel guiding the son's hand as he applies the fish gallbladder to his father's eyes.

King "Tut's" In-Laws

In this connection, Dr. Ruhräh told a story of modern medical practice which almost exactly reversed the old Biblical tale of Tobias and his son. A young Baltimore physician who specializes in treating diseases of the eye was working in a clinic in Boston when a man was brought in suffering from ulcers of the cornea of the eye. The man was a fish dealer. He said that while cleaning a fish he accidentally slit the gallbladder and some of the gall squirted up into his eye, causing the trouble from which he sought relief at the clinic. The young physician was very much interested in what he believed a most unusual case. When he returned home, he told his father, also a physician and a distinguished scholar as well, about this rare case, which, he said, was probably the only one of its kind on record, as he had been able to find no reference in medical literature to blindness or eye injury connected with the gallbladder of a fish.

Whereupon the father replied:

"You may have studied the medical literature, my son, but you do not know your Bible very well," and proceeded to tell him the old tale of Tobias.

The last two patients brought to Dr. Ruhräh's clinic were two very distinguished persons—the mother-in-law and father-in-law of the Egyptian King, Tutankhamon. King Akhnaton, the father-in-law, was a reformer and a very advanced man for his time. He commanded his people to adopt the exclusive worship of one god, a world-god, centuries before monotheism appeared in any other part of the world. Though he did not know it, he thus became the first to further the cause of heliotherapy or, in everyday language, sun healing, because the god he selected for his world-god was the sun god, Re. In order to worship this god, of course, people were bound to be exposed to the sun's health-giving rays.

Dr. Ruhräh showed a picture, carved on stone, of King Akhnaton and his wife, Queen Nefertiti, who was herself a famous beauty, worshipping the sun disk and incidentally getting a good dose of ultraviolet light from the rays of the sun which you can see streaming down on them and their children.

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Science News Letter, July 16, 1932

In these days of rapid progress in medical science, it is interesting to reflect that Disocorides who wrote his "Materia Medica" in the first century A. D. remained the recognized authority on drugs for 1,600 years.

The Science Service radio address next week will be on the subject,

THE MEDICAL CARE of ANIMALS IN THE ZOO

by

Dr. W. Reid Blair

Director of the New York
Zoological Park

FRIDAY, JULY 22

at 1:45 P. M., Eastern
Standard Time

Over Stations of
The Columbia Broadcasting
System

Seven Great Scies

1 DR. ROBERT A. MILLIKAN, Nobel prize winner in physics, leader in scientific thought and head of the California Institute of Technology, speaks on "The Rise of Physics".

2 DR. JOHN C. MERRIAM, authority on the fossil animals and reptiles of western America, president of the Carnegie Institution of Washington, speaks on "The Record of the Rocks".

Who they are and what they talk about
the "GREAT SCIENTIST" Series of Rec

3 DR. EDWIN G. CONKLIN, Princeton University biologist, one of the world's greatest authorities on life processes, speaks on "The Mystery of Life."

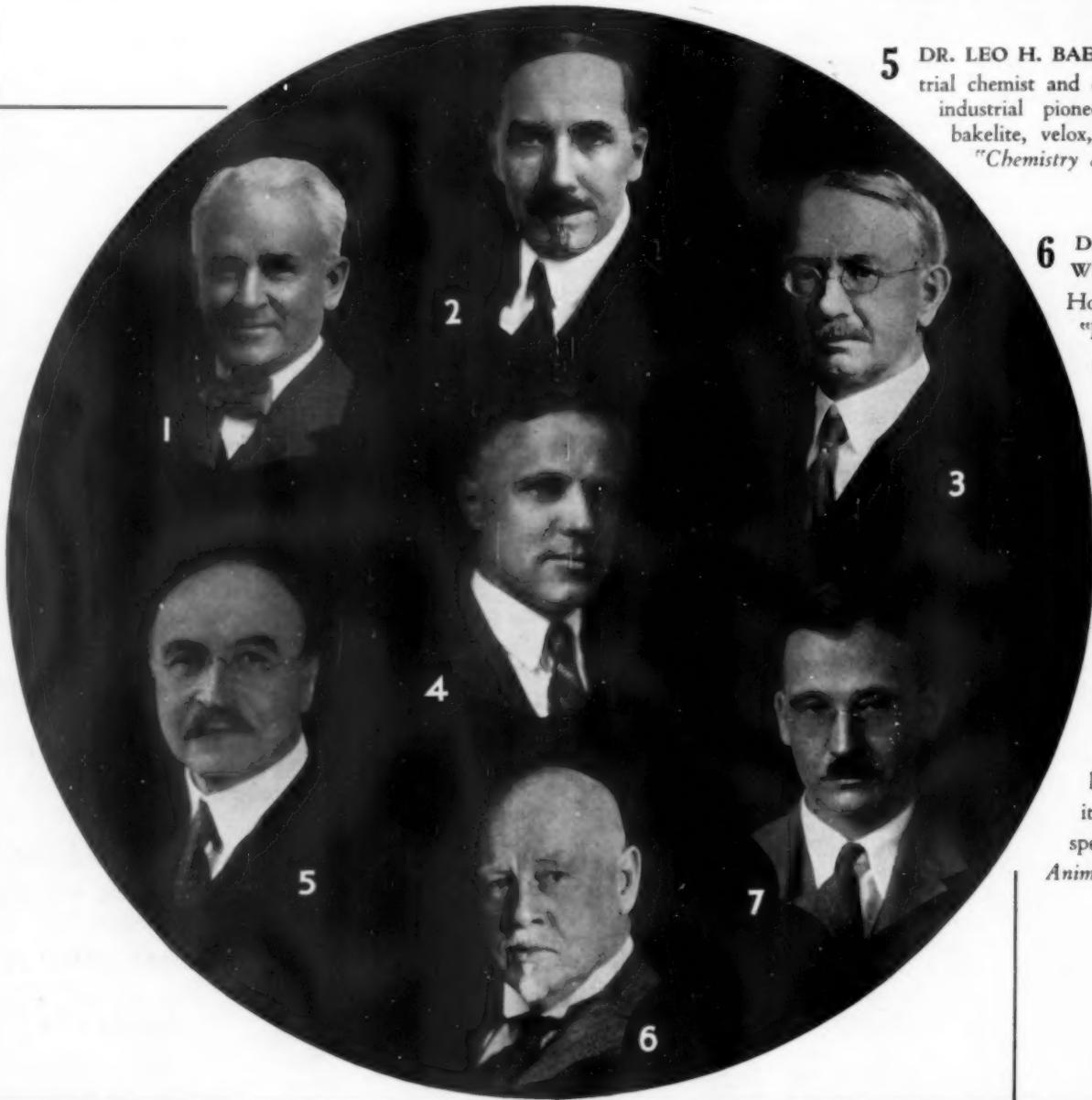
4 DR. KARL T. COMPTON, eminent physicist, president of the Massachusetts Institute of Technology, speaks on "Science and Engi

5 DR. LEO H. BAKELAND, trial chemist and one of America's industrial pioneers, inventer of bakelite, velox, etc., speaks on "Chemistry and Civil

6 DR. WILLIAM H. WELCH, of the Hopkins University, "Dean of American Medicine," speaks on "Tuberculosis".

7 DR. LIA MANNO

Director of the International Zoological Photographic Society, the Smithsonian Institution, leading authority on animal friends, speaks on "Animal Friends".



GENERAL SCIENCE

ests

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Canadian Research Building Ready For Use at Ottawa

See Front Cover

Physical Laboratories of the Dominion, considering the British research establishment at Teddington, just outside London, as the model.

With a staff of over a hundred in the new building at Ottawa, triple that number of associates on its committees and another hundred investigators working on joint projects in universities and other laboratories of the Dominion, research is being conducted vigorously under its president, Dr. H. M. Tory. Available also for research work are a hydraulic testing tank 400 feet long, an internal engine testing laboratory and a wind tunnel.

Canada's national research movement is an outgrowth of the World War, when Germany's supremacy in application of science was pounded by shot, shell and gas into the realization of the rest of the world. The Canadian National Research Council combines for Canada such functions exercised in the United States by its National Research Council and its National Bureau of Standards. An Englishman would be tempted to refer to the Canadian National Research Council as the National

Science News Letter, July 16, 1932

PUBLIC HEALTH

Present Year of Depression Breaks Good Health Record

IN SPITE of widespread unemployment and wage reductions, 1932 has been so far "the best of all health years" for a large section of the industrial population of the United States and Canada. Health conditions from the first of the year to the end of May have been better than ever before for the same period of the year, statistics collected by the Metropolitan Life Insurance Company show.

During this period the death rate among the company's industrial policy-holders reached the unprecedentedly low figure of 9.2 per 1,000. The death rate for May alone was 8.5 per 1,000, the lowest, with the exception of May, 1931, ever recorded for this month. The low rates are due chiefly to large drops in

the death rates for tuberculosis, pneumonia and influenza.

A new low point in the tuberculosis death rate this year is expected on the basis of the low figure set during the January-May period, which is the part of the year when mortality from this disease is always highest.

Accidents, even automobile accidents, caused fewer deaths thus far in 1932 than in the same period of 1931, and there were fewer deaths than ever before connected with childbirth.

The dark spot on this picture of good health is caused by increases in the deaths from diabetes and cancer. The mortality from cancer is much higher than ever before, with a rise of almost eight per cent. since 1931.

Science News Letter, July 16, 1932

GEOLOGY

Darwin on Missing Links

"A Classic of Science"

Fossil Records of Species are Necessarily Incomplete But Intermediate Forms Link Ancient and More Recent Life

ON THE ORIGIN OF SPECIES by Means of Natural Selection, or The Preservation of Favoured Races in the Struggle for Life. By Charles Darwin. London: John Murray. 1859.

I HAVE ATTEMPTED to show that the geological record is extremely imperfect; that only a small portion of the globe has been geologically explored with care; that only certain classes of organic beings have been largely preserved in a fossil state; that the number both of specimens and of species, preserved in our museums, is absolutely as nothing compared with the incalculable number of generations which must have passed away even during a single formation; that, owing to subsidence being necessary for the accumulation of fossiliferous deposits thick enough to resist future degradation, enormous intervals of time have elapsed between the successive formations; that there has probably been more extinction during the periods of subsidence, and more variation during the periods of elevation, and during the latter the record will have been least perfectly kept; that each single formation has not been continuously deposited; that the duration of each formation is, perhaps, short compared with the average duration of specific forms; that migration has played an important part in the first appearance of new forms in any one area and formation; that widely ranging species are those which have varied most, and have oftenest given rise to new species; and that varieties have at first often been local. All these causes taken conjointly, must have tended to make the geological record extremely imperfect, and will to a large extent explain why we do not find interminable varieties, connecting together all the extinct and existing forms of life by the finest graduated steps.

He who rejects these views on the nature of the geological record, will rightly reject my whole theory. For he may ask in vain where are the numberless transitional links which must for-

merly have connected the closely allied or representative species, found in the several stages of the same great formation. He may disbelieve in the enormous intervals of time which have elapsed between our consecutive formations; he may overlook how important a part migration must have played, when the formations of any one great region alone, as that of Europe, are considered; he may urge the apparent, but often falsely apparent, sudden coming in of whole groups of species. He may ask where are the remains of those infinitely numerous organisms which must have existed long before the first bed of the Silurian system was deposited: I can answer this latter question only hypothetically, by saying that as far as we can see, where our oceans now extend they have for an enormous period extended, and where our oscillating continents now stand they have stood ever since the Silurian epoch; but that long before that period, the world may have presented a wholly different aspect; and that the older continents, formed of formations older than any known to us, may now all be in a metamorphosed condition, or may lie buried under the ocean.

Passing from these difficulties, all the other great leading facts in palaeontology seem to me simply to follow on the theory of descent with modification through natural selection. We can thus understand how it is that new species come in slowly and successively; how species of different classes do not necessarily change together, or at the same rate, or in the same degree; yet in the long run that all undergo modification to some extent. The extinction of old forms is the almost inevitable consequence of the production of new forms. We can understand why when a species has once disappeared it never reappears. Groups of species increase in numbers slowly, and endure for unequal periods of time; for the process of modification is necessarily slow, and depends on many complex contingencies. The dom-



CHARLES ROBERT DARWIN

inant species of the larger dominant groups tend to leave many modified descendants, and thus new sub-groups and groups are formed. As these are formed, the species of the less vigorous groups, from their inferiority inherited from a common progenitor, tend to become extinct together, and to leave no modified offspring on the face of the earth. But the utter extinction of a whole group of species may often be a very slow process, from the survival of a few descendants, lingering in protected and isolated situations. When a group has once wholly disappeared, it does not reappear; for the link of generation has been broken.

We can understand how the spreading of the dominant forms of life, which are those that oftenest vary, will in the long run tend to people the world with allied, but modified, descendants; and these will generally succeed in taking the places of those groups of species which are their inferiors in the struggle for existence. Hence, after long intervals of time, the productions of the world will appear to have changed simultaneously.

We can understand how it is that all the forms of life, ancient and recent, make together one grand system; for all are connected by generation. We can

understand, from the continued tendency to divergence of character, why the more ancient a form is, the more it generally differs from those now living. Why ancient and extinct forms often tend to fill up gaps between existing forms, sometimes blending two groups previously classed as distinct into one; but more commonly only bringing them a little closer together. The more ancient a form is, the more often, apparently, it displays characters in some degree intermediate between groups now distinct; for the more ancient a form is, the more nearly it will be related to, and consequently resemble, the common progenitor of groups, since become widely divergent. Extinct forms are seldom directly intermediate between existing forms; but are intermediate only by a long and circuitous course through many extinct and very different forms. We can clearly see why the organic remains of closely consecutive formations are more closely allied to each other, than are those of remote formations; for the forms are more closely linked together by generation: we can clearly see why the remains of an intermediate formation are intermediate in character.

The inhabitants of each successive period in the world's history have beaten their predecessors in the race for life, and are, in so far, higher in the scale of nature; and this may account for that vague yet ill-defined sentiment, felt by many palaeontologists, that organisation on the whole has progressed.

PHYSIOLOGY

Nudism Unnecessary For Sufficient Ultraviolet Light

NUDIST cultists and others who preach extreme exposure of the human body can not justify their fads on the grounds that they are necessary to prevent rickets.

Keep your hands and face uncovered in the moderate sunshine such as occurs at the latitude of middle New York state, Prof. Arthur Knudson of the Albany Medical College, told the American Association for the Advancement of Science, and there need be no fear of being afflicted with rickets, the disease of the bones that arises from lack of ultraviolet light or vitamin D.

Experiments with rats showed Prof.

Knudson that if one-eighthieth of the surface area of the skin were shaved and bared to the sun's radiation, greater healing of rickets was produced than if the whole animal were exposed. Although through three to four months of winter the sunshine does not contain curative rays, the body builds up sufficient reserves in summer to prevent rickets during the winter.

Ungloved hands and exposed faces of children or adults will give sufficient chance for the sun to do its protective work and nude sunbaths for normal persons would not seem necessary in the light of Prof. Knudson's experiments.

Science News Letter, July 16, 1932

"Maxwell's Demon"

who might get around the statistical second law of thermodynamics, appears in

THE NEXT CLASSIC OF SCIENCE

If it should hereafter be proved that ancient animals resemble to a certain extent the embryos of more recent animals of the same class, the fact will be intelligible. The succession of the same types of structure within the same areas during the later geological periods ceases to be mysterious, and is simply explained by inheritance.

If then the geological record be as imperfect as I believe it to be, and it may at least be asserted that the record cannot be proved to be much more perfect, the main objections to the theory of natural selection are greatly diminished or disappear. On the other hand, all the chief laws of palaeontology plainly proclaim, as it seems to me, that species have been produced by ordinary generation: old forms having been supplanted by new and improved forms of life, produced by the laws of variation still acting round us, and preserved by Natural Selection.

Science News Letter, July 16, 1932

PSYCHIATRY

Frequent Use of Hypnotism Urged Upon Psychiatrists

PSYCHIATRISTS have been advised by Dr. Oscar J. Raeder of Boston to make more frequent use of hypnotism both for diagnosing and treating mental disorders. At a recent meeting of the American Psychiatric Association Dr. Raeder described cases in which he found hypnosis a quick and ready means of discovering what ailed patients in whom no physical signs of disease appeared.

A patient complained of blindness, but his eye doctor could find nothing to account for his symptoms. At the first interview, he was hypnotised and it was suggested to him that after a short sleep he would be able to see. He woke up and found to his astonishment that he could look into bright light from a window without difficulty. This, however, was only the beginning, and the patient was told to return for further treatment. It was not necessary to use hypnotism again, however, for his confidence had been won and at the next interview the real nature of the disorder was found to be mental, based on a domestic difficulty. The patient recovered and of course had no further difficulty with his eyes.

Dr. Raeder described suggestibility as a peculiarity of the mind. In hypnosis, he explained, the mind is perfectly concentrated, with no outside distraction at all. In a light state of hypnosis the patient remembers everything that has happened during the time he was hypnotised, but in a very deep state he moves about in a trance and remembers nothing at all.

In treating disease, the lighter states are much more valuable. In these states there is a greater degree of consciousness, the patient's personality exercises a greater influence through other mental faculties, such as reasoning and judgment. In the lighter states suggestion must be given over a period of time, but the effect is much more lasting. In some cases, Dr. Raeder observed, hypnosis may be only a quicker way of getting at the patient's real trouble, but in other cases he believes that it is not only quicker but actually more effective for diagnosis and treatment.

Science News Letter, July 16, 1932

The thin cloud of gaseous particles throughout interstellar space is so rarefied that millions of cubic miles of it would weigh only a fraction of an ounce.

• In Science Fields

PALEONTOLOGY

Australian Family Tree Traced to Africa

A RELATIONSHIP can now be traced between living Australian natives and the heavy-jawed, bull-necked men who lived in Africa thousands of years ago, as represented by the fossil remains found in Rhodesia, is the theory advanced by Dr. Eugene Du Bois. Australian natives, the world's most primitive people alive, have long puzzled science. They now appear to be a hang-over from an ancient pattern of man.

The recent discovery of fossil remains at Ngandong, Java, supplies a missing piece in the Australian puzzle, as Dr. Du Bois sees it. Dr. Du Bois gained fame in scientific circles when he was a Dutch colonial army surgeon in Java, back in 1891, and found in a river bed the remains of the famous Pithecanthropus erectus, the so-called ape-man of Java.

Reporting conclusions to the British scientific journal *Nature*, Dr. Du Bois points out significant resemblances and relationships between a group of skeletal remains of ancient man. He compares the new Javanese skull from Ngandong, another Javanese skull known as the Wadjak skull which Dr. Du Bois himself found in Java in 1890, the Rhodesian skull found in Africa in 1921, and the Talgai skull of a youth found in Queensland, Australia. Dr. Du Bois concludes that the skulls show a relationship, though not necessarily in a direct line, between old Rhodesian man and the modern Australian.

Science News Letter, July 16, 1932

ANTHROPOLOGY

People Unlike Eskimos Lived in Alaskan Village

DIGGING into the lowest depths of an Eskimo village deposit in Alaska, Dr. Ales Hrdlicka of the U. S. National Museum has made the surprising discovery of the remains of a people different from the Eskimos.

These older inhabitants of the village were neither Eskimos nor Aleuts, Dr. Hrdlicka writes in a communication to

the Museum in Washington, D. C. They resembled very closely the type of the California Indians.

The site where Dr. Hrdlicka is excavating is at Larsen's Bay, Kodiak Island, off southern Alaska.

Commenting on the unusual condition in this Alaskan village where Indians gave place to Eskimos long ago, Dr. Hrdlicka writes: "This is, so far as I know, the first case on this continent where two different peoples are actually found in the same deposit."

The anthropologist found some of the old Indian burials under nine feet of deposits, and even in the old original ground which underlies the whole accumulation of village debris. Some of these early burials had been crushed by the weight of debris over them, but some are in better condition. Even when a specimen is crushed, enough remains usually to show the type, Dr. Hrdlicka states.

Science News Letter, July 16, 1932

FORESTRY

Living Trees Picture Ancient American Forests

MILLIONS of years ago California and Oregon were forested with trees unlike those now found there. A Carnegie Institution of Washington expedition has found on the slopes of the Venezuelan Andes the living close relative of ancient trees of western America.

Prof. Ralph W. Chaney of the University of California and Dr. Erling Dorf of Princeton University by traveling into South and Central America were able to see a picture of what the ancient forests of America's west coast must have looked like millions of years ago before there were human eyes to see them.

Their discovery upholds the theory that forests that once existed in North America were pushed south as the climate became increasingly cold and dry.

Leaf-prints of the ancient west coast trees are found as fossils in the rocks of today.

Science News Letter, July 16, 1932

PUBLIC HEALTH

Malaria Cases Traced To Drug Addict's Syringe

FIVE CASES of malaria in San Francisco were due to infection by the syringe of a narcotic drug addict who also had malaria, in the opinion of Dr. J. C. Geiger, Director of Public Health, who reported the unusual occurrence to the American Medical Association.

"Nothing like this in my experience has ever occurred before," Dr. Geiger declared.

Ordinarily malaria is transmitted by the bite of a certain species of mosquito in whose body the malaria germ passes one phase of its life cycle. However, malaria may be transmitted directly by injecting blood of malaria patients into the veins or muscles of another person. This is the method followed in the malaria treatment of paresis.

Two of the patients developed malaria on the same day, February 1. In Dr. Geiger's opinion one of these infected the others by passing around his syringe for morphine injections without first cleaning and sterilizing it. That such passing around of a common syringe is customary among addicts was confirmed by the clerk of a hotel where one of the men lived. Three of the hotels where they were known to have lived were investigated for evidences of mosquitoes, which transmit malaria, and mosquito breeding places, but none was found.

Science News Letter, July 16, 1932

SEISMOLOGY

Mexico is Visited by Another Earthquake

ONE MORE earthquake was added to the unusual series of recent seismic shocks that have occurred in Mexico in the last few months when a moderate quake centered in the Gulf of California Thursday (July 7) at 11:16 a. m., E. S. T. Instruments in American seismological observatories at Georgetown University, St. Louis University, Fordham University, University of California, Pasadena Seismological Laboratory and the Dominion Observatory at Victoria, B. C., were affected. From records wired to Science Service, the U. S. Coast and Geodetic Survey determined the exact location at 27.6 degrees north latitude and 112.5 degrees west longitude.

Science News Letter, July 16, 1932

MEDICINE

Malignant Tumors Abound With Fatty Substances

THE MORE severe, malignant tumors of high killing power, such as cancer, contain a much higher percentage of fatty substances than the less malignant tumors, Dr. Morio Yasuda of Tokyo Imperial University and Dr. W. R. Bloom of the University of Rochester School of Medicine and Dentistry, have just reported to the American Society for Clinical Investigation. Their report, published in the current issue of the society's *Journal of Clinical Investigation*, is based on chemical analyses of various kinds of human and mouse tumors made at the University of Rochester.

The tumors analyzed were divided into three groups according to degree of malignancy, as far as this could be estimated. In the first group of less malignant tumors the various fatty substances, such as phospholipids, cholesterol and neutral fat, were present in low percentages. These tumors included the types known as fibrosarcoma, neurofibroma, fibromyoma of the uterus, and colloid adenoma of the thyroid gland.

The two malignant groups, containing a high percentage of fats, included human carcinomas, or cancers, of stomach, pancreas, breast, uterus and colon, and mouse carcinomas. Some of the tissues upon which the human tumors were growing, such as uterus muscle and colon tissue, were also analyzed, and found to have a much lower percentage of fatty substances than the tumors or cancers.

Science News Letter, July 16, 1932

PHYSICS

Mme. Curie's Daughter Confirms Neutrons

NEW AND DIRECT proof of the existence of the new particle of matter called the neutron has been obtained by Mme. Irene Curie, daughter of the discoverers of radium, and her husband, Dr. F. Joliot of the Institut de Radium, Paris.

The discovery is announced in a communication to the British scientific journal, *Nature*.

Proof of the existence of penetrating radiations which are neither X-rays, such as are emitted from high voltage tubes, gamma rays such as produced from radium, nor electrons was obtained during a bombardment experiment. The two scientists concluded that the rays

must be identified with the neutrons, previous evidence for the existence of which was obtained by Dr. J. Chadwick of Cambridge, England.

The light metal, lithium, was bombarded with alpha particles or charged helium atoms obtained from the radioactive metal polonium. The secondary rays given off from the lithium differed from gamma rays which had the same penetration through lead because they were much more readily absorbed by paraffin.

The penetrating neutron rays obtained by the bombardment of metals like boron and beryllium have the same properties, but there are no known X-rays or gamma rays of the same strength with which to compare them. Dr. Chadwick's assumption of the existence of the neutron depended upon the idea that when neutron rays hit the metal atoms and disrupt them, throwing out bits of inner stuff in the form of alpha particles and protons, these violent collisions follow the same laws of conservation of energy and momentum as the shocks between billiard balls.

Science News Letter, July 16, 1932

ASTRONOMY

New Comet Probably Twin To Newman Comet

A COMET, presumably new, has been discovered. It is faint and located in the southeastern evening skies just north of the constellation of Sagittarius. It will be known as the Schmitt comet after the astronomer who discovered it late in June. It is of the 13th magnitude and too faint to be seen with the unaided eye.

It is probably a twin to the Newman comet, discovered a few weeks ago by an astronomer at the Lowell Observatory, Flagstaff, Ariz. The Schmitt comet is within half a degree, about equal the full moon's diameter, of the position of Newman's comet, and the motion reported for it is exactly the same as that of the earlier discovery. This makes it seem that the new body is a companion of Newman's comet. Comets in the past have been known to break into two bodies, which then travel for a time side by side.

Science News Letter, July 16, 1932

ARCHAEOLOGY

Hundreds of Monte Alban Tombs Yet Unexplored

HUNDREDS of ancient Indian tombs are left in Monte Alban, judging by archaeological evidence, says Alfonso Caso, who discovered treasure in one.

Although graves in the sacred cemetery city were sacked by rival Indian factions even before America was discovered, and by Spaniards later, as well as by treasure hunters in more recent times, Sr. Caso believes that only an insignificant number have been touched.

The burial places are well disguised. Famous "Tomb number seven" in which almost fabulous gold and gems were found, is only a slight lens-shaped protuberance on a hillside, with stumps of house foundations on top. There are almost countless protuberances in similar places in Monte Alban.

The new road the governor of Oaxaca built to Monte Alban, to enable archaeologists to work there, accidentally cut several tombs. In one was alleged to have been found a quantity of fine jade ornaments. Road-building Indian soldiers are said to have kept these for themselves. This was before the

beginning of the archaeological working season. The remarkable treasure tomb missed being cut by the road by only several yards.

The treasure tomb is twenty-one feet long, and is divided into two small rooms. A person of medium height can walk upright through the rooms. Niches in the walls were empty when found. Indian workmen say they were for incense burners.

Of the other eight tombs so far opened, several are mere stone-lined trenches without roofs, and others plain stone-lined rectangular underground rooms. One tomb is cruciform. Another has four underground chambers on different levels and differently oriented.

Indian workmen guard the eight tombs so far opened for the absent archaeologists. They take eight hour turns, and are not afraid of ghosts. There are three who call themselves "tumberos," and are proud that their spades first struck the treasure tomb.

Science News Letter, July 16, 1932

MEDICINE

X-Ray "Baths" Now Possible For Patients With Tumors

X-RAY "BATHS," which irradiate the whole body of the patient for long periods, instead of attacking local spots intensely but briefly, are now available at Memorial Hospital, New York City. They are designed for the treatment of patients suffering deep tumors.

The new set-up for tumor treatment was described before the American Association for the Advancement of Science by Dr. G. Failla. Dr. Failla paid a tribute to the memory of his colleague, the late Dr. Arthur C. Heublein of Hartford, Conn., who supplied both the means and the technical knowledge in the development of this special ward, and in the end sacrificed his life to it through illness induced by overwork.

The ward consists of four beds arranged about an X-Ray machine capable of continuous operation at 185,000 volts and three milliamperes. The patients are kept bathed in its continuous discharge.

It is too early as yet, Dr. Failla said, to permit the clinicians at the hospital to draw definite conclusions as to the efficacy of the new method. However, he continued, some striking results have been obtained in a few cases of generalized radiosensitive tumors, which could not have been obtained by the ordinary methods of X-ray therapy.

At the same symposium with Dr.

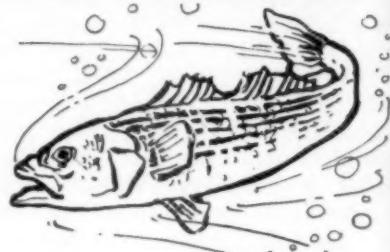
Failla, Dr. H. J. Bagg, also of Memorial Hospital, told of animal experiments performed in this same X-ray "bath." Mice with transplantable tumors have been exposed to the radiation for several weeks, with the result that their life has been prolonged very materially. This has been accomplished without apparent ill effects, since the body weight has remained normal.

Another line of research at Memorial Hospital described by Dr. Failla has been an attack on the problem of the best kind of X-rays to use on various kinds of tumors, and the most favorable times of exposure. It has long been established, he said, that gamma rays from radium are in general more effective than X-rays. The new research has shown that the shorter and "harder" the X-rays are, the more nearly they approach the effectiveness of gamma rays. This was to be expected on theoretical grounds, since gamma rays are the same kind of radiation that X-rays are, only of very much shorter wavelength and considerably more penetrating. The new 700,000-volt X-ray tube in use at the Memorial Hospital gives radiations approaching gamma rays in their nature; and Dr. Failla expressed the opinion that even more powerful tubes are needed, especially for attack on deep tumors.

Science News Letter, July 16, 1932

ICHTHYOLOGY

NATURE RAMBLINGS by Frank Thone



Striped Bass

WHEN the trout goes to sea he becomes a salmon, but the sea-going bass remains a bass. With more room to turn around in, the bass that go to sea often become very big fellows, as witness the great Jewfish of California and Florida waters, that get to be longer than a man and reach weights of a quarter of a ton or more.

But perhaps the finest of these salt-water bass is the rockfish, or striped bass. He grows big enough for any angler who doesn't go in for giant-killing, for he reaches a weight of a hundred pounds or so in extreme cases, and is always of sufficient size to test the strength of a rod and the skill of him that wields it. David Starr Jordan seconds Genio Scott in vouching for his aggressiveness and willingness to fight.

The striped bass is a very handsome fish, slender enough to be graceful, solid enough to give the appearance of strength. His general color is olivaceous, with silvery sides and black stripes along his back.

About 1880 the U. S. Fish Commission introduced this fine fish into the Sacramento River, where it is now very abundant and has large commercial importance.

Science News Letter, July 16, 1932

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The Greek government has ordered that after October first all canned goods sold in that country must bear the date of packing.

Tom Thumb Geyser in Yellowstone National Park has a cone only three feet high.

The male frilled lizard has around his neck a big frill which opens and shuts umbrella-fashion.

• First Glances at New Books

Additional Reviews
on Page 44

Physics

RAMBLING THROUGH SCIENCE—A. L. De Leeuw—*McGraw-Hill*, 320 p., \$2.50. An engineer looks at the new physics, and tells what he sees in language comprehensible and vivid, though not "written-down." There are also brief excursions into physiology, astronomy and a few other fields. The book is not planless, but the plan is very pleasantly informal.

Science News Letter, July 16, 1932

General Science

THE EARTH AND LIVING THINGS—Gerald S. Craig and Beatrice Davis Hurley—*Ginn*, 308 p., 76c. An exceptionally well planned and well written textbook for young beginners in science. The illustrations, especially important in a book designed for a junior audience, are well chosen and pertinent. Especially to be commended is the addition of an index, and a section telling the pupil how to use it.

Science News Letter, July 16, 1932

Comparative Anatomy

STRUCTURE OF THE VERTEBRATES—M. E. Little—*Long and Smith*, 392 p., \$3. An excellently arranged, cleanly illustrated textbook in comparative vertebrate anatomy.

Science News Letter, July 16, 1932

Medical Economics

MIDWIVES, CHIROPODISTS AND OPTOMETRISTS: THEIR PLACE IN MEDICAL CARE—Louis S. Reed—*University of Chicago Press*, 70 p., \$1. Publication of the Committee on the Costs of Medical Care. The Committee has included a study of these secondary practitioners because of the increasingly large part they are taking in furnishing medical care to the general public. Midwifery is a very old type of service, while the other two are comparatively new. All three are striving to improve their standards and to attain the status of recognized practitioners of medical specialties. Efforts and attainments in these directions are described in the report.

Science News Letter, July 16, 1932

Physiology

A TEXTBOOK OF HUMAN PHYSIOLOGY FOR COLLEGE STUDENTS—August Krogh—*Lea and Febiger*, 233 p., \$2.75. Revised and edited by Katherine R. Drinker. This concise text was designed for Danish boys and girls of 16 to 18 years who were preparing for the Uni-

versity. The American edition has been rearranged for use by slightly older, college-age students. The book is completed by nearly a hundred laboratory experiments. It should be a useful text for introductory courses in the subject.

Science News Letter, July 16, 1932

Biochemistry

ANNUAL REVIEW OF BIOCHEMISTRY—Edited by J. M. Luck—*Stanford Univ. Press*, 724 p., \$5. This is the initial volume of a series which will undertake to "present from year to year reviews of the current developments in from twenty-five to thirty of the major fields of interest" in a field that has been growing so rapidly that keeping up with its journal literature has become a simply hopeless task. For an opportunity to get the meat of a year's progress, even in a fairly thick volume, hundreds of biochemists, physiologists, and workers in allied fields will surely rise up and call the editor blessed.

Science News Letter, July 16, 1932

Hygiene

HEALTH AND ITS MAINTENANCE—Bertha Stuart Dymant—*Stanford University Press*, 472 p., \$3.50. An interesting and valuable feature of this comprehensive text for college women is the chapter on mental hygiene, written by Catherine Cox Miles of the psychology department of Stanford University. The text should be successful—the author seems to understand her readers and to know how to appeal to them. For instance, she takes time to give a brief discussion of wrinkles and facial massage.

Science News Letter, July 16, 1932

Ethnology

SORCERERS OF DOBU—R. F. Fortune—*Dutton*, 318 p., \$5. Writing the introduction to this volume, Prof. Bronislaw Malinowski hails it as "a triumph for anthropology," pointing out that the study was made in the relatively short time of six months by a specialist, unaided by any white resident, and untrammelled by hearsay information. Dr. Fortune states that his aim was to add to the knowledge of the people of this New Guinea region, where a number of specialized studies of certain groups have already been made. The important role of magic and sorcery in the life of the Dobuans is the most striking feature of the book.

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Archaeology

THE LURE AND LORE OF ARCHAEOLOGY—Ralph Van Deman Magoffin—*Williams and Wilkins*, 107 p., \$1. In a series of vivid little essays, Prof. Magoffin describes the aims and fascination of archaeology, its technique and its obligations. The middle section of the book deals briefly with some of the notable discoveries that have been made in Egypt, Greece, Palestine, and other countries.

Science News Letter, July 16, 1932

Neurology

THE PRINCIPAL NERVOUS PATHWAYS—Andrew Theodore Rasmussen—*Macmillan*, 73 p., \$2.50. The charts and diagrams in this book are based on many years' experience in teaching neurological anatomy to second-year medical students at the University of Minnesota. The book is designed to present the subject in as simple and efficient a manner as possible, bearing in mind the crowded curriculum of modern medical schools. Each chart is accompanied by explanatory text.

Science News Letter, July 16, 1932

Ornithology

LIFE HISTORIES OF NORTH AMERICAN GALLINACEOUS BIRDS—A. C. Bent—*Govt. Print. Off.*, 490 p., 93 pl., \$1. Accounts of birds of the orders Galliformes and Columbiformes, of interest to conservationists, game administrators and game farmers as well as to specialists in bird biology.

Science News Letter, July 16, 1932

Ethnology

NOTES ON THE FOX WAPANOWIWIENI—Truman Michelson—*Government Printing Office*, 195 p., 35c. After describing some of the Fox Indian ceremonials, Dr. Michelson gives four Indian texts and English translations dealing with the Wapanowiwieni rites.

Science News Letter, July 16, 1932

Medical Economics

A SURVEY OF THE MEDICAL FACILITIES OF THE STATE OF VERMONT—Allon Peebles—*University of Chicago Press*, 321 p., \$1.50. A publication of the Committee on the Costs of Medical Care. This report gives a complete, accurate picture of the medical situation in Vermont as regards the general public, physicians, dentists, public health officials, pharmacists and hospital superintendents.

Science News Letter, July 16, 1932

First Glances at New Books

History

THE PEOPLE OF ANCIENT ISRAEL—Dorothy Mills—*Scribner's*, 192 p., \$1.75. A book for young people by a teacher of ancient history. One worthwhile achievement of this little informal history is that it makes clear the place of the Bible characters in the history and geography of Palestine. Miss Mills draws vivid pictures of the life and customs of the Bible world. Maps, historic charts, and reference lists are provided.

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Ethnology

MENOMINEE MUSIC—Frances Densmore—*Govt. Print. Off.*, 230 p., 27 pl., 80c. Another of Miss Densmore's careful studies of the music of Indian tribes. Enlisting the coöperation of singers on the Menominee reservation in Wisconsin, Miss Densmore has recorded 140 songs which are published and analyzed in this volume. The publication also contains a description of a number of the games, dances, legends, and rites which are associated with music in this tribe.

Science News Letter, July 16, 1932

Geography

LIVING GEOGRAPHY, Book I Part I—Ellsworth Huntington, C. Beverley Benson, Frank M. McMurry—*Macmillan*, 346 p., 28 colored maps, 92c. "How Countries Differ" is the subtitle of this very modern text, which aims to give the child as broad a knowledge of the world as he can grasp. This aim is achieved these days, not by encyclopedic lessons on the countries in orderly succession, but by building a geography text around a central theme. Forms of village life and fundamental occupations are the hub idea of this text. The child compares ancient methods of living and ancient ideas of the world with the modern. A large portion of the book is devoted to the exploration of America.

Science News Letter, July 16, 1932

Geography

LIVING GEOGRAPHY, Book II Part I—Ellsworth Huntington, C. Beverley Benson, Frank M. McMurry—*Macmillan*, 506 p., 38 colored maps, \$1.12. "Why Countries Differ" is the subtitle of this text, which follows the book described in the previous review. The countries considered are all in North America. Importance of climate and other features of physical geography are stressed. From his study of villages and

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simple occupations in the preceding book, the child advances in this one to the study of cities, manufacturing, transportation and commerce.

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Nature Study

NATURE RAMBLES: SUMMER—O. P. Medsger—*Warne*, 160 p., \$2. A companion volume to the author's *Nature Rambles: Spring* reviewed in the Science News Letter some time ago. Its appearance now, just on the threshold of summer, is most timely: without question it will become the guide of many a vacationer and many summer-camp lads and their leaders.

Science News Letter, July 16, 1932

Bacteriology

BACTERIA, YEASTS AND MOLDS IN THE HOME—H. W. Conn—*Ginn*, 320 p., \$1.60. This third edition has been revised by Harold J. Conn. The book is intended for students of home economics and also for the practicing housewife. The sections on refrigeration, canning and disease spread have been extensively revised. An appendix gives laboratory experiments.

Science News Letter, July 16, 1932

Ethnology-Art

INTRODUCTION TO AMERICAN INDIAN ART, 2 Vols.—Part I by John Sloan and Oliver LaFarge; Part II by Herbert J. Spinden and others—*Exposition of Indian Tribal Arts*, \$2.25. It is not necessary to see the Exposition of Indian Tribal Arts to enjoy and profit by these essays. In the first part, two authors tell what the Indian is trying to do when he, or she, makes a silver chain, a blanket or a bowl. They point out what is good so clearly that the reader cannot help seeing the difference between the real Indian art and the cheap Indian-made gimcracks demanded by certain elements of tourist trade. Fine illustrations, many in color, point the morals and adorn the pages. Part II by a number of scientists, artists, and other specialists takes up Indian arts, in more detail. A carping critic might lament the absence of an index or table of contents.

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Psychology

FOUNDATIONS OF ABNORMAL PSYCHOLOGY—Fred A. Moss and Thelma Hunt—*Prentice-Hall*, 548 p., \$4.50. The authors believe that previous textbooks on this subject have, as a rule, "ignored the contributions that the sciences of chemistry, bacteriology, and neurology have made to an understanding of mental diseases." They have attempted, in this volume, to fill this lack. Mental disorders are divided by them into two classes—those which are caused by known pathological conditions resulting from certain bodily disturbances, and those for which the cause is unknown. Psychoanalysis and the theories of Freud are dismissed briefly as unscientific and "untrammeled imagination," and are likened to the advertising of certain popular cigarettes.

Science News Letter, July 16, 1932

Ethnology

DESIGN AREAS IN OCEANIA—Herbert W. Krieger—*Smithsonian Inst.* 53 p., 33 pl. To explain the art of primitive men it is necessary to tell a good deal about the men themselves, their customs and artifacts. Hence, this study, with its wealth of ethnological detail, is considerably more than a discourse on primitive art designs. The illustrations that follow the text provide a striking exhibit of the varied arts of the "island world."

Science News Letter, July 16, 1932

Medical Economics

THE COSTS OF MEDICINES—C. Rufus Rorem and Robert P. Fischelis—*University of Chicago Press*, 250 p., \$2.50. Publication of the Committee on the Costs of Medical Care which gives the national bill for medicines and the factors that enter into it. This book contains more of interest to the general public than most of the Committee's publications.

Science News Letter, July 16, 1932

Ornithology

THE BIRD BOOK—C. P. Shoffner—*Stokes*, 363 p., \$2. A non-technical book on birds, designed especially for Bird Club and similar junior work. A feature is a list of questions with each of the not-too-large chapters, each list followed by its set of answers.

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